



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/076,237	02/13/2002	Tae-Ho Jang	2522-13	9968

7590 10/06/2003
MARGER JOHNSON & McCOLLOM, P.C.
1030 S.W. Morrison Street
Portland, OR 97205

EXAMINER

GUERRERO, MARIA F

ART UNIT PAPER NUMBER

2822

DATE MAILED: 10/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/076,237

Applicant(s)

JANG, TAE-HO

Examiner

Maria Guerrero

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 1-6 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to the Amendment filed July 10, 2003.

Claims 1-18 are pending.

Election/Restrictions

2. Applicant's election without traverse of Group I, (claims 7-18) in Paper No. 5 is acknowledged.

Claims 1-6 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 5.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 7, 9, 11-13, 15, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davari et al. (U.S. 6,333,532) in view of Sadana et al. (U.S. 5,930,643).

Davari et al. teaches forming a sacrificial blocking layer pattern on a silicon substrate, sacrificial blocking layer pattern defining and covering an active region (Fig 1-5, col. 2, lines 54-65). Davari et al. teaches introducing oxygen ions at a first energy and at a first dose ($1 \times 10^{18}/\text{cm}^2$) into a surface of a silicon substrate using sacrificial

Art Unit: 2822

blocking layer pattern as a mask (col. 2, lines 50-67, col. 3, lines 1-40, col. 4, lines 8-15, col. 5, lines 15-25). Davari et al. discloses forming a first oxygen-ion-injected region in the silicon substrate and the energy being in the range of 30 KeV to 10MeV and 60 to 210 KeV (col. 2, lines 65-67, col. 3, lines 1-10). Davari et al. discloses introducing second oxygen ions at a second energy using a sacrificial blocking layer pattern (col. 4, lines 8-50). In addition, Davari et al. shows forming a second oxygen-ion-injected region in an upper portion uncovered by the sacrificial blocking layer pattern (col. 3, lines 1-35). Davari et al. teaches removing sacrificial blocking layer pattern and forming the insulating layer by oxidizing through a heat treatment at a temperature of about 1320° C (col. 5, lines 13-60).

Davari et al. shows the heat treatment for about 2-7 hours using an oxidizing atmosphere (argon and oxygen), the introduction of the first and second oxygen ions being sequential (Fig. 1-2A, 3, col. 5, lines 15-20).

Davari et al. does not specifically show the second energy and second dose being less than the first energy and first dose. However, Sadana et al. teaches introducing second oxygen ions at a second dose and the second dose being less than the first dose. Sadana et al. discloses the first implant energy from about 30 to about 400 KeV, the second energy from about 50 to about 200 KeV, the oxidation time from 5 to about 12 hours at a temperature of from about 1300° to about 1375° C. in a gas including argon and oxygen (col. 4, lines 10-20, 45-50, col. 5, lines 20-30, col. 7, lines 5-55).

Art Unit: 2822

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Davari et al. reference by including Sadana et al. teachings in order to better control the insulating layer thickness. The modification is proper because Sadana et al. incorporated on Davari et al. by reference.

4. Claims 8, 16, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davari et al. (U.S. 6,333,532) and Sadana et al. (U.S. 5,930,643) as applied to claims 7, 9, 11-13, 15, and 18 above, and further in view of Fujii et al. (JP 08-167646) (Translation).

Regarding claims 8, 16, and 19, the combination Davari et al. and Sadana et al. does not specifically show the first oxygen ion injected region being a belt-shape or stepped bell shape, the second portion being deeper than the first portion below the active region, and the specific thickness as claimed. However, Fujii et al. shows the first oxygen ion injected region being a belt-shape or stepped bell shape, the second portion being deeper than the first portion below the active region, and the thickness of the mask being 250 nm within the claimed range (Abstract, Fig. 2-3, paragraph 0011-0018).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Davari et al. and Sadana et al. by including Fujii et al. teachings in order to reduce the fabrication time.

5. Claim 10, 14, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davari et al. (U.S. 6,333,532) and Sadana et al. (U.S. 5,930,643) as applied to claims 7, 9, 11-13, 15, and 18 above, and further in view of Liu et al. (U.S. 6,432,798).

Art Unit: 2822

Regarding claims 10, 14, and 17, the combination Davari et al. and Sadana et al. does not specifically show the specific energy as claimed and the angle being 0 degrees. However, Liu et al. teaches the implantation energy being less than 20 KeV as known in the art and implanting with an angle 0 degrees (Fig. 3, col. 3, lines 45-53).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Davari et al. and Sadana et al. by specifying any appropriated energy because one of ordinary skill in the art would focus on energy at the bottom of Liu et al. suitable range in order to extend the depth of the implanted extension (Liu et al., col. 3, lines 45-53).

Response to Arguments

6. Applicant's arguments with respect to claims 7-18 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Guerrero whose telephone number is 703-305-0162.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Art Unit: 2822

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Maria Guerrero
Maria Guerrero
Patent examiner
September 22, 2003